

## COMPARISON OF THE RESULTS OF PEDAGOGY AND ANDRAGOGY IMPLEMENTATIONS USING EDUCATIONAL DATA MINING IN POST GRADUATE MANAGEMENT AND TECHNICAL STUDENTS IN MUMBAI – A PILOT STUDY

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### ABSTRACT

*This study explores the feasibility of Andragogy techniques for Post Graduate Students in our Education System. The impact of internet has been tremendous in this era. However, when we compare usage of internet in education with other fields, we will notice a huge difference. Not everyone find e-learning appealing. Andragogy is one of the feasible ways to go for adaptive e-learning environment, where we can utilize the instructor's aid as well as student's experience as an implementation strategy where the students will not only learn but also share their knowledge and experiences with their peers.*

*This study is a first attempt at studying different student behavior patterns. In this study, we have only compared the differences in student results when they were taught using pedagogy and andragogy techniques. We have analysed that students perform better when they are taught using principles of Andragogy. We have also used an opinionnaire to check whether the students are willing to adapt to Andragogy techniques.*

**Keywords:** Data Mining, Andragogy, Pedagogy, E-Learning,

### INTRODUCTION

This study explores the feasibility of Andragogy techniques for Post Graduate Students in our Education System. The growing interest in the field of Andragogy and E-learning Systems has made way as a potential solution to address many of the issues we are currently facing in our Education System. The impact of internet has been tremendous in this era. However, when we compare usage of internet in education with other fields, we will notice a huge difference. Not everyone find e-learning appealing. Andragogy is one of the feasible ways to go for adaptive e-learning environment, where we can utilize the instructor's aid as well as student's experience as an implementation strategy where the students will not only learn but also share their knowledge and experiences with their peers.

#### Different Issues currently faced by the Student

The first issue that needs to be addressed is the methods followed to teach students. Focus is mainly on Post Graduate Students. The main problem with our education system is the conventional style of teaching that we have adopted for teaching the students. We still are following the teacher-centric method. We are still following the principles of pedagogy. We cannot use the same principles to teach school students as well as college students. An adult's learning behavior cannot be paralleled with children's learning behavior. The teaching method

and behavior needs to evolve with the student's learning pattern and behavior. In traditional learning, we always employ pedagogical principles to teach the students. The content, syllabus, evaluation patterns everything follows the pedagogical principle. It is a rigid system and adult learning behavior is totally different and cannot be aligned with the learning patterns of children. The discipline of pedagogy mainly targets children at school level and not college students. Pedagogy comes from a greek word, where peda refers to 'child' and gogy refers to 'leading' making it the art and science for teaching children. Pedagogy does not fulfill all the needs of a college student. To evolve with the new and advanced management practices, we need to advocate adoption of the term Andragogy. 'Andra' is the form of the word that refers to adults making Andragogy the art and science of teaching adults. An adult learner possesses lot of different characteristics when compared to a child learner. Andragogy focuses on creation of an independent adaptable individual.

### **Difference between adult learning styles and children learning styles**

Children are more accepting when it comes to learning. They need motivation from their instructors. They are willing to learn whatever has been assigned to them. An adult learner is self-directed. He is self motivated. He learns because of the fact that he needs to know. He is solely responsible for his learning. In pedagogy, the instructor assumes full responsibility of what is being taught. The instructor evaluates the students. But, when it comes to Andragogy, the learner has the ability to take responsibility of his learning and self evaluation is one of the main characteristic of this approach. Children have very little experience and they have very limited source of knowledge. In a school setting, the instructor is the one who is the most experienced and hence has total authority over the class. Adults, however, possess great volume of experience. They have already learnt a lot from their experience and can share this experience with each other and expand the knowledge base among themselves. Here, the instructor may not be the most influential person, because the instructor may be an expert in one of fields, whereas a learner might have a collective knowledge of various fields. In this classroom, there is certainly more exchange of knowledge from both the instructor as well as the learner. The wealth of knowledge present in this classroom can be well utilized if tapped as a resource for learning. In pedagogy, the student is motivated by the instructor to learn as that becomes the criteria for him to move to the next level. Adults are more eager to learn, as they are application oriented. They would want to reach a particular level or fill some gaps between where they are now and where they want to be. The readiness factor is engrained in adults as they focus to achieve more. Children generally are focused on subject matter, the content that has been prescribed for their syllabus by the Board. Adults, being more application oriented, they like performing tasks and retrieving results. They are more inclined towards problem solving and learning around work situations rather than subject matter. In Pedagogy, the students are motivated by external factors like ranks, grades, fear of failure etc. In Andragogy, intrinsic factors play a major role in motivating adults, these factors being self esteem, self confidence, self actualization, recognition, better quality of life etc.

### **General Observations in Classroom**

Technical students are more comfortable in a technical subject classroom. They are more interactive and try and answer questions. They are familiar with all the technical jargons and they are comfortable using these jargons while framing sentences. However, when these student's are asked to speak on a general subject matter, they are avoidant. When the students are asked to introduce themselves to the class, they don't participate. They find it difficult to frame sentences

when they are removed from their comfort technical area. The behavior of management students is totally opposite. They are more familiar with general subject matter and are always willing to speak to the class, but when it comes to technical subject, there is a loss of interest from their side. Technical students possess good aptitude in their subjects but fail to present themselves well when it comes to interviews. Management students show more confidence while presenting themselves to the panel. The eagerness to learn what they are lacking also seems to be missing both areas. Many students come from vernacular background and are not confident in conversing in English. So, they avoid communication with the instructor and appear to be non participative. It seems that they avoid being interactive even when they know the right answer just because they are not confident of presenting it well.

This works when it comes to pedagogical view of evaluation based on tests. Since, they just have to write whatever they have learnt from the book, they don't try improving other skills other than their academic performance. Since, they are stuck to pedagogy; they still rely on the instructor to follow the teacher centric approach and leave them to just perform well in their exams. To improve the quality of students and to motivate them for the global competition is the responsibility of the teacher. Approaching each and every student according to their needs and polishing them to be a better employee is the responsibility of the teacher. Technical students generally feel that they will be coding all their life, so there is no need to possess other qualities apart from programming skills. There is a necessity to break this perspective, and encourage every student to be an all rounder excelling in different fields.

## **SCOPE OF THE STUDY**

The study reported here investigates results of Andragogy Implementation in a classroom environment. Its first objective is to determine when all the other factors are kept constant, do the results vary only on the basis of different teaching techniques. Of the many variables showing a relationship to teaching techniques, three were chosen for this investigation: Motivation factors – whether the students are more inclined towards intrinsic or extrinsic motivation, graduation level grades, and the level of interaction with the Instructor. Apart from these factors, various opinions of students are studied to derive whether they are willing to adapt to Andragogy teaching techniques. The hypotheses relevant to this objective were developed.

H<sub>0</sub>: The results of students when Andragogy is implemented are higher than the results of students when pedagogy is implemented

H<sub>1</sub>: The results of students when Andragogy is implemented are lower than the results of students when pedagogy is implemented

$$H_0: \mu_{\text{andragogy implementation}} > \mu_{\text{pedagogy implementation}}$$

$$H_1: \mu_{\text{andragogy implementation}} < \mu_{\text{pedagogy implementation}}$$

## **DATA COLLECTION**

A detailed questionnaire and an opinionnaire was prepared with the reference, assistance and guidance of my Supervisor. The designed two page A4 size close-ended questionnaire was a collection of subject-related questions using pedagogy and andragogy methodologies. The opinionnaire was used for the collection of student details, the factors of motivation and to assess their interest in learning with the help of Andragogy Techniques. Most of the information of the

variables were collected directly from the students through this questionnaire. Based on this information, a few derived variables were generated.

The opinionnaire will include 18 sentences. The first 15 sentences use the Likert scale to select the options. The respondent selects a degree of agreement for each of the statements on a 4-point Likert-type scale ranging from 1 (Strongly agree) to 4 (Strongly Disagree). The remaining three sentences have four to seven options that is used to complete each sentence thereby representing categories of education: graduation grades, frequency of meeting the Instructor and factors of motivation, whether they are more inclined towards intrinsic factors or extrinsic factors. Inclination towards extrinsic factors shows that the student is more comfortable with the pedagogy techniques whereas inclination towards intrinsic factor shows that the student thinks like an adult and can handle Andragogy techniques in education.

Demographic data was also collected as a part of the opinionnaire. Data was collected for the following variables: age, gender, course, graduation course, father's education and occupation, mother's education and occupation and medium of communication in school.

The questionnaire comprised of twenty questions each carrying two marks. Ten questions will be from the portion that will be thought using the principles of pedagogy and ten questions from the portion that will be thought using the principles of Andragogy. The two scores will be compared to find out if the students are able to adapt to the Andragogy techniques in class and if not, we will figure out the reasons behind the unsuccessful implementation

For the pilot study, we selected Post Graduate students enrolled in the course of Masters in Computer Applications (MCA) in the Mumbai University. A total of 56 students of MCA second year who appeared for their examination in December 2014 examination were the samples for our study. All the information related to student's demographic, academic and socio-economic variables was obtained from the 224 students directly through questionnaire. The portion for the questionnaire was selected from the subject 'Advanced Database Techniques' and the students were thought two different sections using pedagogy and Andragogy techniques.

## **ANALYSIS AND FINDINGS**

An opinionnaire was given to the students to check their willingness to adapt to Andragogy techniques. The questions were modeled on the basis of principles of Andragogy. A four point Likert Scale ranging from Strongly Agree to Strongly Disagree was used to collect the opinions of students. 64% of the students disagree to the fact that they would like to learn only the material that the Instructor teaches in the class. 58% students agree and 39 % students strongly agree that they would like to know the purpose of the study at the beginning of the class which is a principle of Andragogy. 58% students disagree that they totally depend on the instructor for the course which shows that they are self reliant which is one of the major requirement for adult learning. 48 % of the students strongly agree and 45 % of the students agree that they will take full responsibility of the course which is another feature of adult learning. 50 % students strongly agree and 47 % students agree that they value the experiences they have learnt in their graduation course. 50 % students agree and 31 % students strongly agree to study whatever the curriculum demands which show their inclination towards Pedagogy system. Majority of the students wish to learn something that can be applied to their life and job, showing that they application oriented

which is a feature in adult learning. 48% students agree and 42% students strongly agree that they prefer exercises like role-playing activities, research based activities, brainstorming and case studies in my academic class which is again based on Andragogy teaching techniques. 55% students strongly agree and 42% students agree that they would like to learn and share from their peers. This again supports Andragogy. 78% students agree that they are interactive in the class which again adds to features of adult learning. Majority of the students still like following lecture method which shows that they are still inclined towards pedagogy. They believe in the traditional teaching methods as they agree for assignments, lectures and other classroom teaching methods. 66% students agree and 28% students strongly agree that they have learnt computer applications basics in their graduation class. This shows that they are capable of learning through Andragogy techniques since their basics are already clear.

Motivation can be looked at as a cycle where thoughts influence behaviors, and behaviors drive performance, performance impacts thoughts and the cycle begins again. Each stage of the cycle is composed of many dimensions including attitudes, beliefs, intentions, effort, and withdrawal which can all affect the motivation that an individual experiences.

Motivation can be divided into two different theories known as Intrinsic (internal) motivation and Extrinsic (external) motivation. In a traditional education setup students are motivated by both Internal and External factors.

Intrinsic motivation is a natural motivational tendency and is a critical element in cognitive, social, and physical development. Students who are intrinsically motivated are more likely to engage in the task willingly as well as work to improve their skills, which will increase their capabilities.

Students are likely to be intrinsically motivated if they:

1. Attribute their educational results to factors under their own control, also known as autonomy or locus of control
2. Believe they have the skills to be effective agents in reaching their desired goals, also known as self-efficacy beliefs
3. Are interested in mastering a topic, not just in achieving good grades

Extrinsic motivation refers to the performance of an activity in order to attain a desired outcome and it is the opposite of intrinsic motivation. Extrinsic motivation comes from influences outside of the individual. Extrinsic motivation occurs when we are motivated to perform a behavior or engage in an activity in order to earn a reward or avoid a punishment.

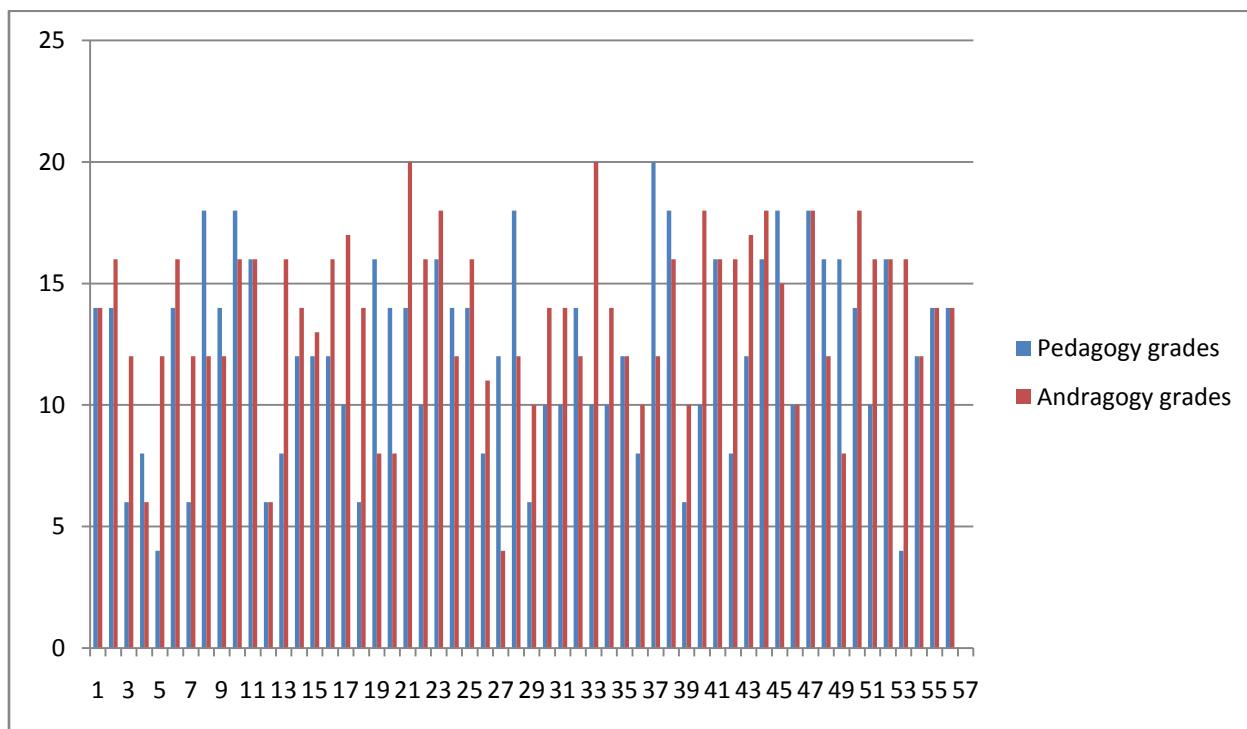
Students are likely to be extrinsically motivated if they

1. Studying because they want to get a good grade
2. Cleaning their room to avoid being reprimanded by their parents
3. Participating in a sport in order to win awards
4. Competing in a contest in order to win a scholarship

An adult student generally tends to be intrinsically motivated. The very fact of non existence of extrinsic motivation factors shows that the student can readily adapt to Adult learning. In the

pilot study, 51 out of 56 students are intrinsically motivated. 91% students show that they are ready to adapt to adult learning techniques.

Students were also asked to solve two questionnaires which were subject related. Two different topics were taught to the same set of students using pedagogy and andragogy techniques respectively. The students were graded for twenty marks and the marks so obtained were compared using t-test. Paired T- test has been used to statistically check whether our hypothesis is valid or not. A t-test's statistical significance indicates whether or not the difference between two groups' averages most likely reflects a "real" difference in the population from which the groups were sampled. A statistically significant t-test result is one in which a difference between two groups is unlikely to have occurred because the sample happened to be atypical. Statistical significance is determined by the size of the difference between the group averages, the sample size, and the standard deviations of the groups. For practical purposes statistical significance suggests that the two larger populations from which we sample are "actually" different. A paired t-test is used to compare two population means where you have two samples in which observations in one sample can be paired with observations in the other sample. Same set of students were assessed first for a portion that was taught to them using the principles of pedagogy and then on a portion which was taught using andragogy principles. Fifty six students from the MCA course were studied and their grades were compared before and after andragogy implementations.



## CONCLUSIONS AND IMPLICATIONS

A dependent-samples t-test was conducted to compare the grades of students. The grades of students were obtained by implementing two different teaching techniques, Andragogy and Pedagogy. There was a significant difference in the scores for Andragogy grades ( $M= 13.6$ ,  $SD=3.5$ ) and IV level 2 ( $M= 12.1$ ,  $SD=4.0$ ) conditions;  $t(\text{stat})=2.26$ ,  $p = 0.013$ . "These results

suggest that there is a significant difference between both the type of implementations. Specifically our results suggest that grades obtained by students while they studied using principles of Andragogy were greater than those obtained while using pedagogy principles. Since, the students came from similar backgrounds, their demographics were very similar to each other. Hence, studying the differences between them based on their demographic details was not possible with this sample. Implementation of EDM will be done further in this research to find other interesting patterns that motivated the student to get educated using the principles of Andragogy.

## **DISCUSSION**

This study is a first attempt at studying different student behavior patterns. In this study, we have only compared the differences in student results when they were taught using pedagogy and andragogy techniques. We have analysed that students perform better when they are taught using principles of Andragogy. We have also used an questionnaire to check whether the students are willing to adapt to Andragogy techniques. We can conclude from the analysis that majority of the students considered in this sample are willing to move towards adult learning. We have also analysed that majority of the students are motivated internally which is a major feature of adult learning. Thus, we can conclude that students in this sample show willingness towards Andragogy or Adult Learning and also perform well when they are taught using the principles of Andragogy.

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